

Application No. 10/606,571
Amendment Dated July 12, 2007
Reply to Office Action Dated July 31, 2006
Submitted After Notice of Appeal Dated February 5, 2007

Remarks

Claims 11, 14-19, 21-22 and 24-26 are pending.

Claims 11, 14-19, 21-22 and 24-26 stand rejected.

Claims 11, 14-119, 21-22 and 24-26 are submitted herein for review.

No new matter has been added.

APPLICANT NOTES THAT AN ERRANT COMMUNICATION WAS MAILED TO APPLICANT ON APRIL 11, 2007 FROM THE U.S. PATENT OFFICE INDICATING A CHANGE OF POWER OF ATTORNEY. APPLICANT CONTACTED THE PATENT OFFICE BY TELEPHONE AND CONFIRMED THAT THE COMMUNICATION WAS SENT IN ERROR. IF THERE ARE ANY PROBLEMS WITH RECEIVING THIS COMMUNICATION OR PROCESSING IT AS A RESULT OF THIS ERRANT COMMUNICATION, PLEASE CONTACT THE UNDERSIGNED IMMEDIATELY.

In the Office Action, the Examiner has rejected the claims under 35 U.S.C. § 103 as being obvious over Hardy et al. (U.S. Patent No. 5,205,289) in view of Taylor et al. (U.S. Patent No. 5,396,323) and Jensen (U.S. Patent No. 5,800,423).

Applicant respectfully disagrees with the Examiner's contentions and submits the following remarks in response.

The present invention as claimed in independent claim 11 is directed to a system for improving back surgery. In particular, a system is provided for positioning and tracing a guiding channel during surgery on a patient. A first moving arm is pivotally

fixed to a first fixed plane and a second moving arm is pivotally fixed to a second fixed plane. A pair of guiding channel fasteners are each coupled to the first and second moving arms and configured to attach to a guiding channel at corresponding first and second reference locations. An encoder unit is coupled to the moving arm, the encoder unit configured to provide signals so as to allow an estimate of the coordinates of the reference locations.

An imaging unit acquires images of the interior portion of the patient's body and *a processor coupled to the encoder unit and the imaging unit calculates a trajectory of a line extending from the surgical tool towards the interior portion of the patient based on data acquired from the encoder unit and displays the calculated trajectory as a superimposed image over the acquired images of the interior portion of the patient's body.*

As noted in the prior Amendment, The present invention provides an advantage over the prior art systems in that it provides manner for improved placement/guidance of surgical tubes used in back surgery by providing an instantaneous feedback showing the projected insertion path superimposed over a real time image (such as an x-ray) of the patient.

This is accomplished by moving the guide tube coupled to the pantograph arms thereby altering the projected insertion path. These movements are detected by an encoder unit that is coupled to the arms which provides such data to the imaging unit that generates a super imposed image of the trajectory over the internal image of the patient.

The cited prior art, either alone or in combination with one another, do not teach or suggest the present invention as claimed.

The cited Hardy reference shows a means for calculating the optimum dose delivery and shape of a radiation zone to be applied to a tumor, using, for example the hypothetical beam path (from external radiation source) or brachytherapy catheter bundle 14. However, there is no teaching in Hardy regarding the actual angles or images used *during* the insertion, but rather deals with mathematical modeling of hypothetical surgeries to determine the best locations for eventual implementation of the therapy.

Both Taylor and Jensen teach surgery stabilization arms that are used for holding a surgical tool stable during a surgery and remote control of such arm. However, neither have sensors (angle encoders) attached to the arms for generating an image of a trajectory of the tools.

It is noted that Jensen has a “feedback mechanism” as cited by the Examiner, for example in column 6, lines 46-58. However, such feedback mechanisms are simply inherent mechanism used for robotic control and are not angle encoders used for measuring the angles between the arms for determining a trajectory of a surgical tool.

Firstly, the cited prior art references, either alone or in combination with one another do not teach or suggest the present invention as claimed. For example, neither Hardy, Taylor or Jensen disclose, a processor coupled to the encoder unit and the imaging unit calculating a trajectory of a line extending from the surgical tool towards the interior portion of the patient based on data acquired from the encoder unit. As noted above, Hardy has no sensors and processors at all related to *actual* projections of tool trajectories attached to arms and Taylor and Jensen only contain sensors for controlling movements of arms, but contain no teachings regarding sensors that are used for generating trajectory images. In fact, the present invention proposes the use of robotically controlled arms *in addition to* the encoder and processor units for supplying the superimposed trajectory image as evidenced in the specification and dependent claim 17 for example.

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Second, even if the references are combined as suggested by the Examiner, the resulting structure would still not read on the present invention as claimed. Presumably, if the Hardy, Taylor and Jensen references were combined the resulting system would simply teach a 3D imaging system for generating a proposed surgical path (Hardy) and then a robotic surgical tool stabilization arm (Taylor and Jensen) that is used to move the tool according to the desired location(s). However, such a system would still not disclose, displaying the calculated trajectory as a superimposed image over the acquired images of the interior portion of the patient's body.

For at least these reasons, Applicant respectfully requests that the rejection of independent claims 11 and 18, and the rejection of the claims that depend therefrom, be withdrawn.


In view of the foregoing, Applicants respectfully submit that all pending claims are currently in condition for allowance, the earliest possible notice of which is earnestly solicited. If the Examiner feels that an additional telephone interview would advance the prosecution of this application he is invited to contact the undersigned at the number listed below.

Respectfully submitted

SOFER & HAROUN, LLP

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By:


Joseph Sofer

Reg. No. 34,438

317 Madison Avenue

Suite 910

New York, New York 10017

(212)697-2800

Customer # 39600